



FIG. 1.—Scanning electron micrographs of tetrad pollen of *Eschscholzia californica*

over one hundred plants from 12 other populations of *E. californica* and their hybrids. However, the genetic basis of this inheritance cannot be estimated with the data available.

Examination of pollen of pressed voucher specimens of *Clark 492* (3 plants) and *Clark 503* (2 plants) and of flowers collected in April, 1977, from the approximate location of *Clark 492* revealed only monad pollen. Some greenhouse-grown plants of *Clark 492* present only monads, but it is somewhat surprising that there should be no evidence of tetrad pollen in the natural populations, since the trait is so common in their progeny. Perhaps these plants form tetrads in response to some condition of the greenhouse environment.

I wish to thank Judith A. Jernstedt for invaluable assistance with the scanning electron micrographs, and D. W. Kyhos for critical review of the manuscript. Pollen vouchers are deposited in the Department of Botany, University of California, Davis, and seeds for propagating the populations are available to interested investigators from the author.—CURTIS CLARK, Department of Botany, University of California, Davis 95616.

COMBINATIONS IN THE GENUS *ERIOGONUM* (POLYGONACEAE) NOT PROPERLY PROPOSED BY MUNZ IN "A FLORA OF SOUTHERN CALIFORNIA."—A few months after his death, "A Flora of Southern California" was published by the University of California Press (1974), and the final work and fitting tribute of Philip A. Munz was made available to his friends, colleagues, and to the people of California. He and I had collaborated on a treatment of the genus *Eriogonum* (Polygonaceae) for his "Supplement to A California Flora" (University of California Press, 1968), but as he wished to use the subspecific rank as his major infraspecific category in the 1974 book, I suggested he independently prepare the treatment and allow me to review it. This was done. I advised him in certain matters regarding the use of subspecies in *Eriogonum*, and he thereby avoided making some superfluous new combinations for taxa which occur beyond the limits of southern California. However, possibly through an oversight and no doubt aggregated by his illness, some of his proposed new combinations in the flora were not validly published in accordance with the International Code of Botanical Nomenclature, mainly because the basionym and its place of publication were not cited. I cannot take into consideration all of these various names, but as I communicated and talked with Dr. Munz on the names associated with *Eriogonum*, and knew his intentions, I feel the oversights can and should be corrected so that the names used in his flora are valid. Therefore the fol-

lowing combinations are made here: *Eriogonum kearneyi* Tidestr. ssp. *monoense* (S. Stokes) Munz ex Reveal, comb. nov., based on *E. nodosum* Small ssp. *monoense* S. Stokes, Leafl. W. Bot. 3:201. 1943; *E. spergulinum* A. Gray ssp. *reddingianum* (M. E. Jones) Munz ex Reveal, stat. nov., based on *Oxytheca reddingiana* M. E. Jones, Bull. Torrey Bot. Club 9:32. 1882. The first name was credited to Stokes by mistake, and in the second case the basionym was not cited. Several months before his death I called Dr. Munz and informed him that the type of *E. elatum* ssp. *glabrescens* S. Stokes was actually a specimen of *E. latens* Jeps., and that a new combination would be necessary. He agreed but apparently could not make the change for his Flora. The proper name, he concurred, would be as follows: *E. elatum* Dougl. ex Benth. ssp. *villosum* (Jeps.) Munz ex Reveal, stat. nov., based on *E. elatum* var. *villosum* Jeps., Fl. Calif. 1:421. 1913.

Supported by NSF Grant BMS75-13063.—JAMES L. REVEAL, Department of Botany, University of Maryland, College Park 20742; and National Museum of Natural History, Smithsonian Institution, Washington, D.C. 20560.

REVIEW

The genus Epilobium (Onagraceae) in Australasia: a systematic and evolutionary study. By PETER H. RAVEN and TAMRA ENGLEHORN RAVEN. With illustrations by Keith R. West. 321 pp. 1976. New Zealand Dept. of Scientific & Industrial Research Bulletin 216. Published by A. R. Shearer, Government Printer, Wellington, N.Z. \$20.00 NZ.

This sumptuous botanical monograph may be termed a labor of love both literally and figuratively: the authors who published on New Zealand *Epilobium* in 1971 as Raven and Englehorn are listed in 1976 as Raven and Raven. Although one hesitates to use the overworked word "mastpiece" for a taxonomic revision in the 20th century, this book with its superb illustrations (partly in color) by Keith West, attractive format, and meticulously detailed narrative harks back to the tradition of the great illustrated folio volumes by Hooker of the 19th century. The DSIR and the Government Printer merit applause from the botanical world for publishing a work of such exemplary merit.

The work consists of four chapters of discussion preceding a systematic treatment of the 50 species of *Epilobium* found in Australasia (mainly Australia, New Zealand, and New Guinea). The essay on crossing and ecological relationships published in 1972 (in Valentine, Taxonomy, Phytogeography, and Evolution) is here expanded to provide considerably more detail about the 45 native species.

The discussion of breeding systems in Australasian *Epilobium* owes a great deal to the work of the New Zealand botanist W. B. Brockie (1897-1972), who made over 900 crosses between the various taxa; the authors have appropriately dedicated the volume to his memory. Studies by the Ravens on the pollen fertility of Brockie's voucher specimens show that, in contrast to the Holarctic species of *Epilobium*, the Australasian ones readily form interspecific hybrids with a high degree of fertility. However, there is a surprising difference between the Australian species, which include a number of strongly outcrossing taxa, and the New Zealand species, which are predominantly (33 out of 37) autogamous. The authors regard the extraordinary radiation of *Epilobium* in New Zealand to be the result of extensive hybridization between sympatric populations that are kept apart by autogamous breeding systems and different habitat preferences (the latter graphically indicated in some detail).

An unusual feature of the Ravens' taxonomic interpretation of the New Zealand *Epilobiums* is their treatment of sympatric populations. No less than 40 of the 45 Australasian species occur sympatrically, and in New Zealand the Ravens found 9 or 10 taxa occurring together in the same local population! In a distinctly heterodox fashion, they have abandoned the conventional "subspecies displacement" rule, and